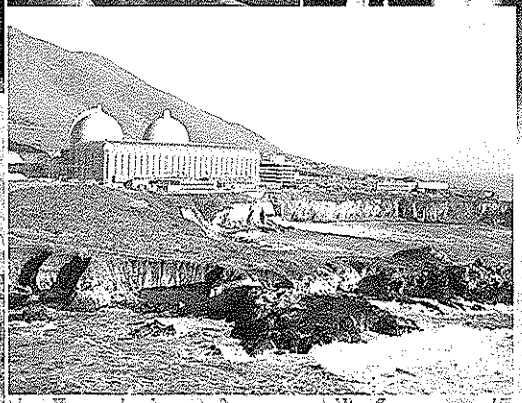
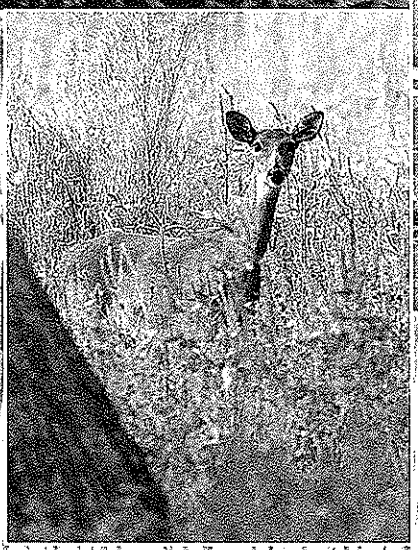
Powering the Future With Environmentally Sound Nuclear Energy

The Ecological Stewardship of The Nuclear Energy Industry





Powering the Future With Environmentally Sound Nuclear Energy

Just over 100 nuclear plants supply electricity for one of every five homes and businesses across the country. Nuclear energy is a reliable, safe and clean source of electricity for today, and it will be even more vital in the future.

As nuclear energy's contribution to America's energy supply has increased, so too have the environmental advantages that it provides and its importance as a secure domestic energy source. In fact, with such a large output from relatively few plants, nuclear energy has the smallest environmental footprint of any large power supply source.

Nuclear energy has the smallest environmental footprint of any large power supply source.

Beginning in the 1960s, growing concern about the environment led to passage of several major U.S. laws—among them, the 1970 Clean Air Act, which established stringent standards for the gaseous and particulate emissions from industrial facilities and power plants. The first nuclear plants were just beginning to operate at that time.

Since then, nuclear energy—as it expanded to become today's second-largest source of electricity—has made a staggering contribution toward the reduction of harmful emissions. Between 1973 and 2000, U.S. nuclear power plants avoided the emission of 66.1 million tons of sulfur dioxide and 33.6 million tons of nitrogen oxide, compared to fuels that otherwise would have produced electricity.

In 2000 alone, nuclear plants avoided the emission of 4.1 million tons of SO_2—nearly as much as the entire power sector reduced its emissions between 1990 and 2000 (4.5 million tons) as a result of the Clean Air Act. Nuclear plants also avoided the emission of about 2 million tons of NO_X and 174.4 million metric tons of carbon in 2000. In the absence of nuclear energy, U.S. electric sector emissions of carbon would have been 27 percent higher that year.

Yet none of the clean air legislation acknowledges nuclear energy's significant role in avoiding air pollutants and greenhouse gases altogether.

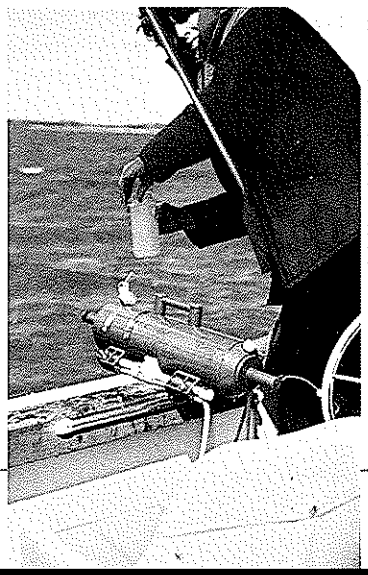
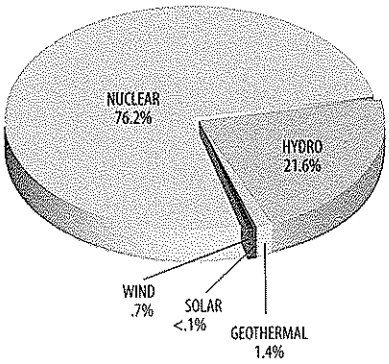


PHOTO COURTESY OF DOMINION GENERATION

▶A Dominion Generation environmental specialist samples water from Lake Anna, near the North Anna nuclear plant.

Over the past dozen years, concern has grown over a new threat—global warming. Scientific evidence is mounting that carbon dioxide and other greenhouse gases are building in the atmosphere. At current levels, many scientists contend that the earth may have already warmed somewhat and, if left unchecked, will harm the world's climate.

Many of the world's industrialized countries are responding with programs to reduce dramatically the emission of greenhouse gases. Since carbon dioxide is by far the most abundant greenhouse gas, much of the effort has been directed at coal and natural gas power plants and other large stationary sources of carbon emissions.



U.S. Sources of Emission-Free Electricity (2001)

Many countries have signed the international Kyoto accords, which obligate them to reduce carbon dioxide emissions by specific target percentages through 2012. The United States already has a voluntary carbon reduction program, and has decided to continue with the voluntary approach. In 2000, the nuclear energy sector accounted for 43 percent of the carbon reductions reported nationwide.

A number of countries are discovering that they will suffer severe economic losses, including billions of dollars and hundreds of thousands of jobs in some countries, in complying with the goals of the Kyoto accords. They are also finding that the loss in economic production and jobs will be much less severe if they include emission-free nuclear energy in their plans to meet the Kyoto goals. Some countries, such as Japan, South Korea and several European nations, will rely heavily on nuclear energy in meeting their environmental goals, while other countries are rethinking their plans to curtail or eliminate nuclear power in light of this environmental imperative. Finland, in fact, recently decided to build a new nuclear plant to help meet its energy and environmental goals.

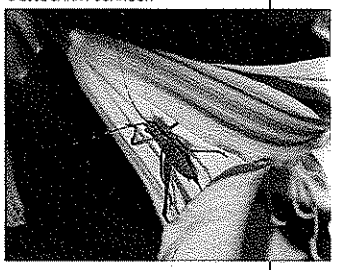
Increased nuclear energy production has played a key role in meeting Clean Air Act standards over the past three decades.

The U.S. government has affirmed the valuable contribution of nuclear energy to the environment in formulating both its new clean air and national energy policies. Nuclear energy is by far the largest emission-free source of electricity in the United States, accounting for three-quarters of all clean-air electricity.

Nuclear power plants have improved their productivity by one-third since the beginning of the 1990s, which has reduced the cost of energy from these facilities and further avoided air pollution from fossil plants where the electricity would have been produced. Even with the best available emission control technology, coal-fired power plants still emit large amounts of carbon dioxide and other pollutants. Natural gas is lower in emissions than coal, but periodic supply shortages have led to soaring gas prices and spot shortages. Renewable electricity generation sources such as solar and wind power also are emission-free, and their use will expand in the future. However, the infrastructure to support their large-scale use has yet to be developed and, since

they are dependent on the weather, they may never prove well-suited to 24 hours a day, seven days a week power production. Hydroelectric power generates about 10 percent of our electricity, but is not expected to grow in the future.

The combination of the improved economics and reliability of nuclear energy make it virtually certain that all nuclear plants, most of which are in the second half of their 40-year federal licenses, will seek 20-year extensions of their licenses. Ten reactors already have received renewed licenses, and license renewal applications for 20 more reactors are under review. In addition, many reactors have expanded their electric generation capacity, and one nuclear reactor that had been shut down is planning to restart.



▲ *The daylily is one of the many flowers that flourish near the Grand Gulf plant.*

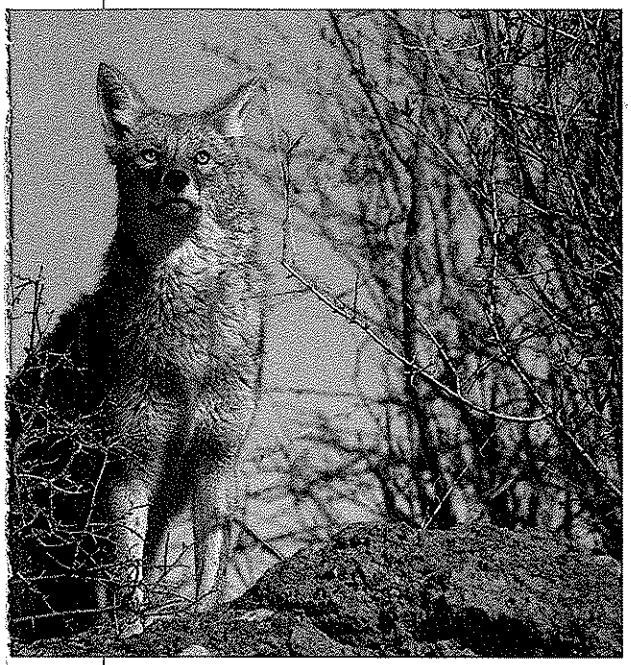


PHOTO COURTESY OF ARIZONA PUBLIC SERVICE COMPANY

The increased production and longer operating lives of existing U.S. nuclear plants will make significant improvements to environmental quality. However, electricity demand in the United States will continue to grow. The U.S. Department of Energy estimates that if electricity demand grows at the same rate it did during the 1990s, we will need about 40 percent more electricity by 2020.

◄ *The resourceful and adaptive coyote prefers the protected habitat of the Palo Verde nuclear plant site, where water is more plentiful than elsewhere in the Sonoran Desert.*

The U.S. nuclear industry has established a goal of building 50,000 megawatts of new nuclear energy capacity by 2020—the equivalent of 50 large nuclear power plants—in addition to plans to expand existing plant capacity by 10,000 megawatts. That is an ambitious expansion plan, but it will only be enough to maintain the current 30 percent share of U.S. emission-free electricity generation. Most of the rest of the emission-free generation is hydropower, which has very little potential for expansion. Renewable energy sources like solar and wind energy are expected to double during this period, but will generate just 5 percent of U.S. electricity.

► *Amaryllis blossom near the Grand Gulf plant.*

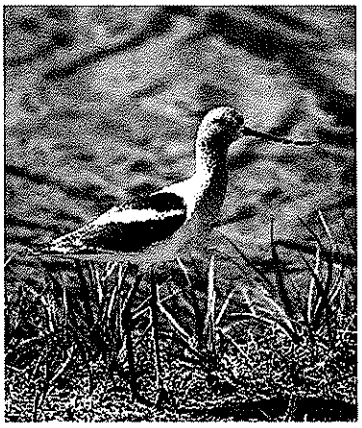


PHOTO COURTESY OF ARIZONA PUBLIC SERVICE COMPANY

▲ *The avocet is among the many species of birds attracted to the Palo Verde habitat.*

The Department of Energy in 2002 launched its Nuclear Power 2010 program to facilitate the construction of new nuclear power plants by the end of this decade. DOE is funding research into advanced nuclear technologies, and has issued grants to three companies to study the new federal regulatory process for siting a new nuclear plant.

Three major factors make it highly likely that new nuclear power plants will be built: the projected lower capital costs for new standardized nuclear plant designs, a streamlined NRC licensing process that includes public participation early in the process, and the uncertainty of both fuel supply and environmental impact of other power plants. However, financing the first few new nuclear plants may be made more difficult because of the initial financial commitment required to build and operate the first generation of a new technology.

Financing will be more attractive if the environmental advantages of nuclear energy are reflected in the overall value of the plants.

The Clean Air Act amendments of 1990 established an emission trading system designed to reduce the level of SO_2 and NO_x. Essentially, this market mechanism establishes a cap, or limit, on pollution and provides emission allowances to power plants and other stationary sources. Plants that reduce emissions below the limit and have excess allowances can then sell them to plants that exceed pollution limits. The emissions trading program reduces the pollution level while allowing generators the flexibility to reduce emissions in the most economic way.

The federal government is considering expansion of emissions trading, and inclusion of carbon dioxide in the program, as part of its future clean air strategy. The industry believes that nuclear energy should be included in any future emission credit/trading program.

U.S.FISH AND WILD LIFE SERVICE

▲ *Many nuclear plants have nesting programs for bald eagles, like these immature birds.*

Despite the fact that nuclear energy and other technologies such as renewables produce no emissions, they are not part of the current trading programs. The environmental benefits of nuclear power could be recognized if nuclear power plants are included in future emission credit trading programs. The value nuclear plants would receive from credit trading would help to attract new plant financing.

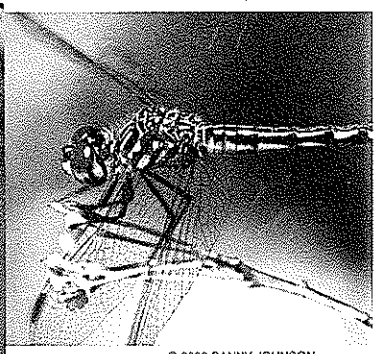
The federal government is now considering expansion of emissions trading, and possibly including carbon dioxide in the program, as part of its future clean air strategy. The industry believes that nuclear energy should be included in any future emission credit/trading program.

Wildlife of all types finds refuge in natural habitats around nuclear plants.

PHOTO COURTESY OF DUKE POWER

◀ *Butterflies enjoy meadow habitat near Duke Power's nuclear plants.*

▼*A dragonfly samples a blossom near the Grand Gulf plant.*



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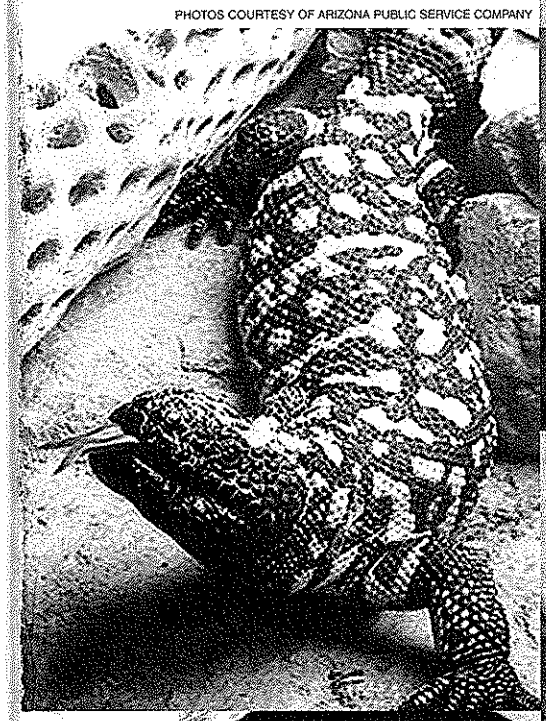
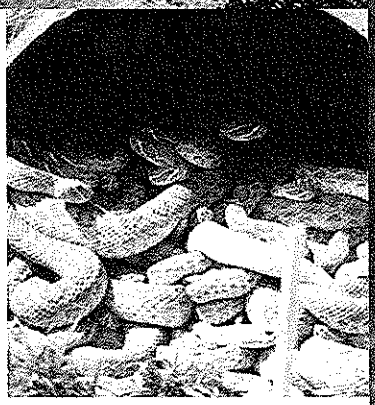


◀ *Gila monsters (far left) and red-tailed hawks can be seen near Palo Verde.*

PHOTO COURTESY OF SOUTH TEXAS PROJECT

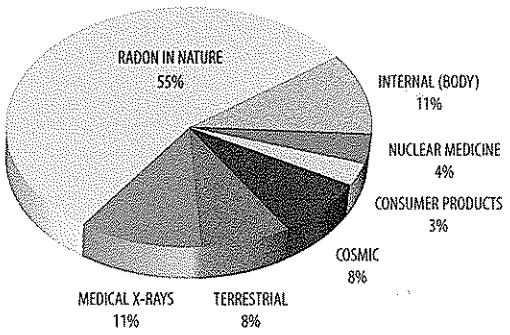
PHOTO COURTESY OF PROGRESS ENERGY INC



▲ *Rattlesnakes gather at one of Progress Energy's nuclear plants, and a watchful deer eyes the photographer at South Texas Project.* ▶

The Ecological Stewardship of the Nuclear Energy Industry

All methods of producing electricity affect the environment to some degree, but the impacts of nuclear energy are minimal—among the lowest in the electricity sector. Because the fuel in nuclear power plants is radioactive, nuclear plants are carefully designed, built and monitored to prevent releases of radioactive materials. The Environmental Protection Agency sets—and the Nuclear Regulatory Commission enforces—strict standards governing radiation emissions.



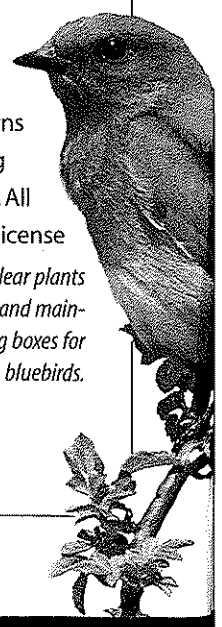
Sources of Radiation Exposure

The average American is exposed to 360 millirem of radiation annually from the natural environment and man-made sources, like medical X-rays, food and drink, the earth itself, and "cosmic rays" from space. A cross-country plane trip, for example, would expose an individual to 10 millirem, roughly a hundred times as much radiation as living next to a nuclear plant for a year.

To make sure that nuclear power plants operate well within those standards, radiation levels at every plant are monitored 24 hours a day, seven days a week. Even soil, cows' milk from neighboring farms, and fish and sediment in nearby rivers and lakes are regularly tested. The monitoring instruments are so sensitive that they can measure even trace amounts of radiation. Nuclear power plant emissions are well below the safe levels permitted by federal standards. That is why the environment has never been harmed by radiation emissions from a U.S. nuclear power plant.

Even the people living closest to a nuclear power plant would receive less than one millirem of radiation exposure each year, which is less than the exposure those people receive every day from the natural environment.

Most nuclear plants are located along lakes, rivers or the seacoast, and before a nuclear power plant begins operating, an environmental impact statement examines all potential impacts to water quality from the operation of the plant. These include concerns about the discharge of heated water and the possibility of trapping aquatic life in the piping used to draw cooling water into the plant. All issues are resolved as part of the plant's NRC licensing process. If a license is later renewed, the company must certify that no significant adverse impacts have been observed during the plant's operating life.

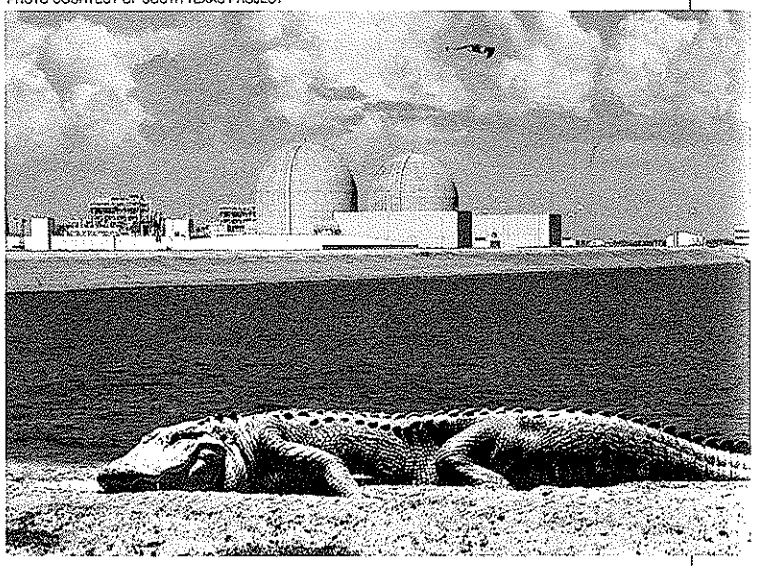


►*Many nuclear plants have built and maintain nesting boxes for bluebirds.*

Like all electric power plants, nuclear power plants must use water for cooling. That is why so many of them are located on bodies of water. The water that is used to make the steam, and that comes into contact with radioactive material, is kept in strictly enclosed, recirculating systems. It never mingles with the cooling water, and is never discharged. The cooling water, slightly warmed but carrying no measurable radioactivity, is discharged after use.

Cooling water discharged from a plant contains no harmful pollutants, but it still must meet federal Clean Water Act requirements and state standards designed to protect water quality and aquatic life. If the water is warm enough to cause possible harm to aquatic life, it is cooled before it is returned to the river, lake or bay. It is either mixed with water in a cooling pond or pumped through a cooling tower before it is discharged. In addition, power plants operate under National Pollutant Discharge Elimination System permits, which specify standards and monitoring requirements for the plants. These permits must be renewed every five years.

PHOTO COURTESY OF SOUTH TEXAS PROJECT



▲ *An alligator suns itself near South Texas Project.*

The NRC also reviews plant operations to be sure there are no adverse impacts to water quality and aquatic ecology. In fact, nuclear plants are excellent habitats for marine and plant life, including a number of endangered and protected species. Also, the safety of the discharge canal from boat traffic has provided refuge to such endangered species as manatees and crocodiles in Florida.

For example, seven years before Calvert Cliffs nuclear power plant began operating on the banks of the Chesapeake Bay, scientists began studying the local marine life—blue crabs, oysters, fish and others. With more than 30 years' worth of data, scientists have determined that the Calvert Cliffs plant has no adverse effect on the local marine life, and has benefited some species.

According to studies conducted by scientists at the Academy of Natural Sciences Estuarine Research Center (ANSERC), populations of Chesapeake Bay blue crabs in the vicinity of the plant showed no change since it began operating. In addition, catches at control sites several miles away were nearly the same as near the plant.

Other ANSERC studies determined that oysters placed in the discharge stream of Calvert Cliffs grew slightly faster than those in other locations. Constellation Nuclear is currently funding a program for planting disease-resistant oysters in the Chesapeake Bay.

▼ *The cliffs that give the Calvert Cliffs plant its name are maintained in their natural state.*

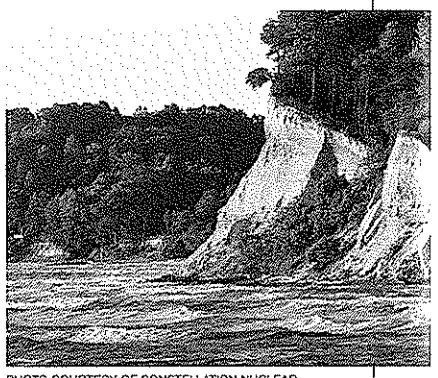
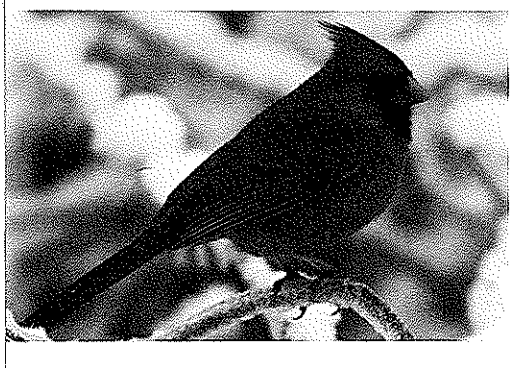


PHOTO COURTESY OF CONSTELLATION NUCLEAR



▲ *Calvert Cliffs employees participate in an annual count of cardinals.*

"I believed early on that Constellation had a commitment to the environment, both in learning what was there and then protecting it," said George Abbe, senior scientist at the academy's research center. Constellation's commitment to Chesapeake Bay shows in the continued funding of studies even after initial research had shown the plant was safe, he added.

In addition to preserving marine life, nuclear plant operators provide natural habitat for mammals, reptiles, birds and plants found on or near plant sites. Many have created special nature parks or wildlife sanctuaries, monitoring and protecting endangered and threatened species.

Dominion Generation protects a bald eagle nesting site at its Surry nuclear plant and nesting boxes for wood ducks and barn swallows at its North Anna nuclear plant. It also has built 20 underwater block-and-brush structures in Lake Anna, where young fish can find cover and large fish can feed and spawn.

Public Service Enterprise Group's plants are located on the ecologically sensitive Delaware River estuary. The company has developed a comprehensive Estuary Enhancement program, which is the largest privately funded program of its kind in the country, and perhaps in the world. The program has won a number of environmental awards, including most recently the National Oceanographic and Atmospheric Administration's Excellence Award in Coastal and Ocean Resource Management.

▼ *A sea turtle swims serenely near the Brunswick plant in North Carolina.*

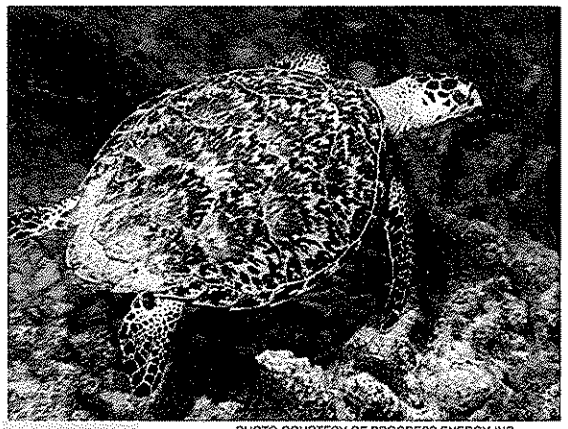


PHOTO COURTESY OF PROGRESS ENERGY INC

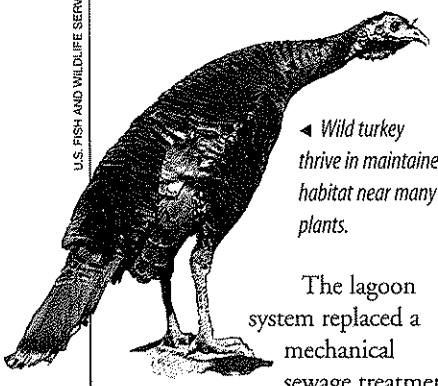
PHOTO COURTESY OF PUBLIC SERVICE ENTERPRISE GROUP

◀ *Because the environment around a nuclear power plant is so clean, the areas are often developed as environmentally rich wetlands, providing better nesting areas for waterfowl and other birds, new habitats for fish, and sanctuaries for other wildlife, flowers and grasses like this one on the Delaware River.*

All of the 103 U.S. nuclear plants also carry out a variety of ecological programs, depending on their locations and circumstances. The following section provides a summary of their activities.

AmerenUE

Callaway—Fulton, Mo. In 1996, AmerenUE built a three-pond lagoon-wetland system as an environmentally sound way to purify the sanitary wastewater from the Callaway nuclear plant.



U.S. FISH AND WILDLIFE SERVICE

◄ *Wild turkey thrive in maintained habitat near many plants.*

The lagoon system replaced a mechanical sewage treatment facility. Instead of chemicals, the lagoon system retains the effluent until biological treatment can break down any pollutants. The wastewater is then stored in a specially constructed wetland prior to discharge for further treatment, where plants such as cattails, reeds and willows filter out any remaining pollutants and remove sediment. The project resulted in part from a cooperative study with students from the University of Missouri-Columbia's STEPS (Students Training in Engineering Problem Solving) program.

For the past 25 years, the company has had an agreement with the Missouri Department of Conservation for the development and management of the forest, fish and wildlife resources on more than 6,000 acres surrounding the Callaway plant. That agreement resulted in the creation of the Reform Conservation Area. AmerenUE donates forest management and agricultural revenues from the area to fund the Department of Conservation programs. In addition to the forest management and agriculture activities, other programs include wildlife, land and water protection. The Department of Conservation maintains 104 ponds and lakes in the area for fishing and wildlife enhancement. The area also provides quail, wild turkey and deer hunting. Other allowed public activities include hiking, picnicking, bird watching and nature study.

American Electric Power

Cook 1 and 2—Bridgman, Mich. The Cook site is nestled in the southwest corner of Michigan along the beautiful Lake Michigan coastline. The two reactors are situated on more than 650 acres, part of the largest freshwater dune formations in the world. In addition to magnificent coastal dunes, the site includes hardwood forest and wetlands. The site contains various threatened species of plants that are protected in Michigan, and is a haven for deer, wild turkey and migratory waterfowl.

The hardwood forest is protected from logging to preserve the natural setting surrounding the site. During Earth Day celebrations, plant personnel have distributed more than 5,000 seedlings to the public and planted mature trees at local high schools. Wetland areas on the site are enhanced and protected from development and the ongoing workings of the plant. The company organizes annual clean-up days to patrol the mile-long coastline along Lake Michigan.

Plant personnel take pride in helping to protect water quality on Lake Michigan, through storm water protection programs approved by the Michigan Department of Environmental Quality. The site also has created natural buffer zones around all wetlands and creeks on the property to protect them.

The Nipissing Dune Trails are situated along the northern boundary of the site. The trails were certified by the Wildlife Habitat Council in 1997, and were awarded WHC Land for Learning certification in 2001. The three-mile nature trail winds through forest and includes a boardwalk over wetlands and an overlook of Lake Michigan. Hundreds of schoolchildren each year participate in educational programs about the dunes. American Electric Power also sponsors local community park programs in Michigan that enhance natural areas such as Chikaming Woods.

Arizona Public Service Company

Palo Verde—Wintersburg, Ariz. The three-reactor Palo Verde site is located in Arizona's Sonoran Desert, where water is precious. To avoid straining the region's water resources, Pinnacle West Capital Corp., the

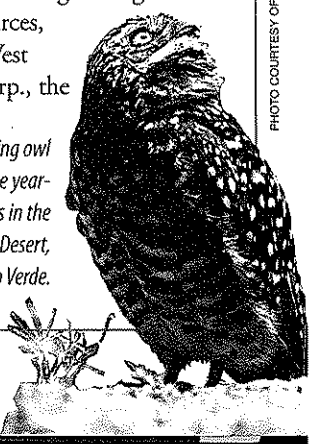


PHOTO COURTESY OF ARIZONA PUBLIC SERVICE COMPANY

►*This burrowing owl is one of the year-round residents in the Sonoran Desert, home of Palo Verde.*

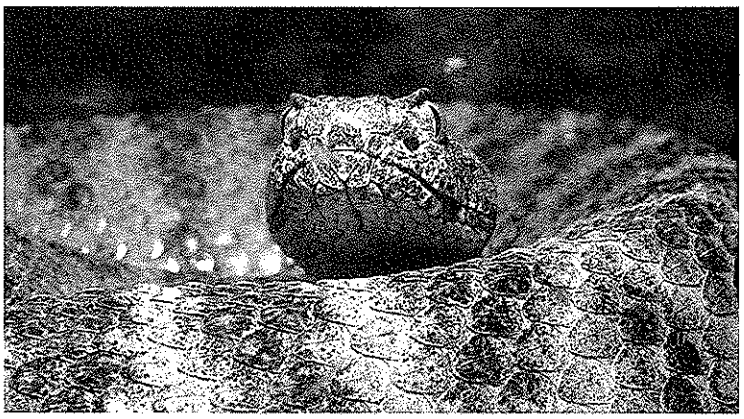


PHOTO COURTESY OF ARIZONA PUBLIC SERVICE COMPANY

▲ *The Palo Verde site makes even the Mohave rattlesnake feel welcome.*

plant's majority owner, uses reclaimed municipal sewage for the plant's cooling water. The program won the 1987 Outstanding Engineering Achievement Award from the National Society of Professional Engineers.

Pinnacle West buys more than 20 billion gallons of sewage plant effluent annually from Phoenix and other Arizona municipalities. The water is piped to the Palo Verde site, then processed and stored in a Water Reclamation Facility, an 80-acre reservoir for use in the site's three cooling towers. The plant also stores used cooling water in lined evaporation pools to prevent dissolved minerals from mixing with the scarce groundwater in the area. The program has been so successful that other power plants being built in the area are buying capacity from the Water Reclamation Facility for their own cooling needs.

The site itself, with its more than 4,000 acres, is located on what was once an irrigated cotton farm. Pinnacle West has made extensive use of natural materials and vegetation in restoring the site after construction of the reactors. The site now offers a natural and protected habitat for desert wildlife. That includes the Gila monster, a poisonous lizard whose only known habitat is the desert area near the plant.

Pinnacle West has a wildlife protection program that, among other features, insulates power lines and other electrical equipment to minimize the danger for birds of prey and other animals. The birds, including Harris's Hawks, Red-Tailed Hawks and Great Horned Owls, like to perch, and nest, on power lines.

The Palo Verde environmental staff also is trained and licensed to relocate and transport injured wildlife—from raccoons to rattlesnakes—to rehabilitation facilities. They also monitor and care for the thousands of migrating waterfowl drawn to the cooling water facilities while flying over the desert.

Constellation Nuclear

Calvert Cliffs 1 and 2—Lusby, Md. The Constellation Energy Group has been awarded wildlife habitat certification by the Wildlife Habitat Council for its accomplishments at the Calvert Cliffs Nuclear Power Plant. Specific programs noted by the Wildlife Habitat Council include the protection of the endangered Puritan and northeastern beach tiger beetles, protection of a bald eagle nesting site, bluebird boxes, osprey nesting platforms and food and cover programs for wild turkey and bobwhite quail.

In 1993, Constellation Energy Group signed a land management protective agreement with the Maryland office of the Nature Conservancy. Its purpose was to protect the cliff and beach habitats at Calvert Cliffs, home to 90 percent of the world's population of Puritan and northeastern beach tiger beetles. Both species are on Maryland's endangered species list and are considered endangered nationwide. The plant has built a fence to keep visitors and vehicles outside a 100-foot buffer zone. Persons with permission from the Nature Conservancy to study and monitor the beetles are allowed limited access.

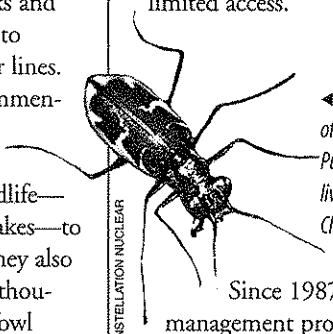


PHOTO COURTESY OF CONSTELLATION NUCLEAR

◀ *Ninety percent of the world's Puritan tiger beetles live near the Calvert Cliffs plant.*

Since 1987, the forest management program for the 2,800-acre Calvert Cliffs site has improved habitat for local wildlife, especially white-tailed deer, wild turkey and other birds. The company replants trees after mature trees are logged, plants mixed grasses on fire roads and does not harvest mature oak and hickory trees.

The company has protected a bald eagle nest, moved osprey nests from utility poles to specially built platforms, and has built bluebird and kestrel nests. A 1.5-mile nature trail was built jointly by the company and a local Boy Scout troop.

PHOTO COURTESY OF CONSTELLATION NUCLEAR

▲ *An old barn was left in its original place but in better condition at Calvert Cliffs.*

Sixty acres at Calvert Cliffs are farmed for corn, wheat, soy beans, barley and hay. To reduce the percentage of nitrogen runoff, the farm is part of a nutrient management program offered by the state and county agricultural extension services. Various farming techniques are used to minimize harm to the Chesapeake Bay.

Nine Mile Point 1 and 2—Scriba, N.Y. The Nine Mile Point Nuclear Station occupies 1,000 acres on the southern shore of Lake Ontario. The Erie-Ontario Lowlands is a flat and gently rolling landscape of glacial deposits. More than half of the site is undeveloped, and this natural state is preserved from human intrusion, allowing vegetation and wildlife to thrive.

The site features a pond and a wooded wetland that have been restored and enhanced to preserve their natural values. Wildlife species include rabbit, raccoon, fox, deer and turkey. The southern shore of Lake Ontario is on a major migratory route for waterfowl and other birds.

Nine Mile Point Nuclear Station was the first nuclear facility in the nation to have its environmental management system certified by the International Organization for Standardization.

Environmental considerations are fully integrated into daily operations and business planning. The program helps to strengthen operational controls, reinforce employee commitment to environmental objectives and policies and improve compliance with the requirements.

Lake Ontario is the smallest of the five Great Lakes, but its volume of water makes it the 11th largest lake in the world.

Nine Mile Point thoroughly investigated the aquatic life that might be affected by operations. Before Nine Mile Point Unit One began commercial operation in 1969, it conducted extensive studies of fish, invertebrates that live in the sediments, and the microscopic plants and animals at the base of the food chain. These studies continued for almost 30 years, long after it was accepted that operations have had no appreciable effect on the health of the lake.

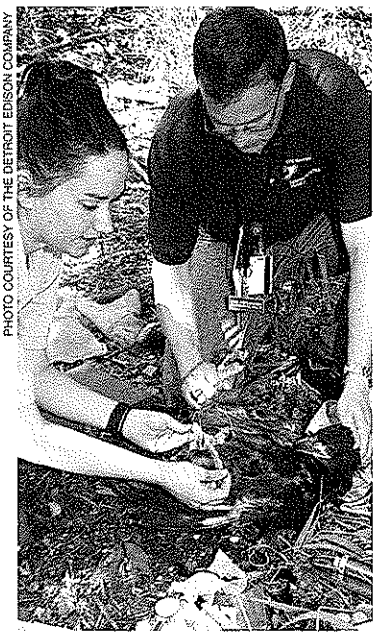
The Detroit Edison Company

Fermi 2—Newport, Mich. The Fermi 2 plant has received awards from the Michigan state government as a Clean Corporate Citizen, and from the Michigan Business Pollution Prevention Partnership. The Wildlife Habitat Council has given Detroit Edison a site certification in recognition of the plant's efforts, which include a shoreline preservation project to restore a series of peninsulas threatened by natural erosion at a lagoon next to Lake Erie.

The eastern fox snake, massasauga rattlesnake and the Blanding's turtle are among the endangered or threatened species being protected at the site. Detroit Edison works with Ducks Unlimited and the Audubon Society, and has installed bluebird and wood duck houses. The company is building brush piles on the site to help animals survive the sometimes harsh winters.

Fermi 2 has a wildlife habitat steering committee to help decide which projects will provide the most environmental benefit. The plant is building nature trails using volunteers from the Boy

PHOTO COURTESY OF THE DETROIT EDISON COMPANY



▲ *The Fermi plant has won recognition from the U.S. Fish and Wildlife Service for protecting eagle nesting areas.*

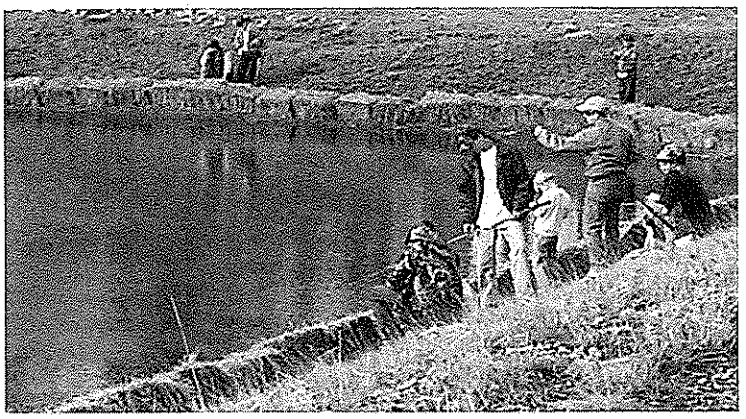


PHOTO COURTESY OF DOMINION GENERATION

▲ *Fishing tournament at Lake Anna, one of Virginia's leading recreation spots. The man-made lake provides cooling water for Dominion Generation's North Anna plant.*

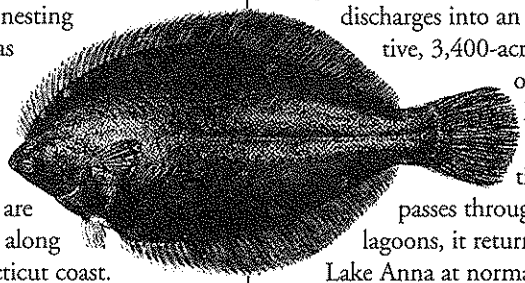
Scouts and Cub Scouts, church groups, company personnel and others. Phases one and two of the five-phase project have been completed, and phase three is under way. Fermi 2 also maintains a vivarium at its visitors center. The vivarium displays plants, animals and fish from the site.

The plant is also working on plans for timber stand improvements beneficial to wildlife. These include selective thinning to help promote diversity of tree species and heights, and ground cover; and improvement of nesting habitat for birds and perching areas for raptors. Fermi 2 environmental specialists are also mapping plans to work with the state Department of Fish and Wildlife to plant prairie grass and begin wetlands restoration.

Dominion Generation

Millstone 2 and 3—Niantic, Conn. Dominion's two Millstone plants have received the Connecticut Department of Environmental Education Green Circle Award for their implementation of an environmental management system. Millstone also has received the Electric Power Research Institute Innovators Technology Award for research on cooling water alternatives to prevent harm to winter flounder larvae.

Millstone has successfully restored osprey to the plant's area after pesticides reduced their numbers in the 1950s and '60s, before the plants were built. The first osprey nesting platform was installed in 1967 and today, many active nests are maintained along the Connecticut coast. The environmental laboratory staff annually monitors the reproductive success of osprey around Millstone.



U.S. FISH AND WILDLIFE SERVICE

▲ *The winter flounder is protected at Dominion Generation's Millstone site.*

Millstone participates in Dominion's annual Environmental Volunteer Day by sponsoring an environmental project. In 2001, more than 70 Millstone workers spent the day at Denison Pequotsepos Nature Center in Mystic, Conn., rebuilding bridges, clearing brush and repairing stairs, walkways and the parking lot. In addition to the labor, Dominion provided funding for the projects.

North Anna 1 and 2—Louisa, Va. The North Anna plants and Dominion's other Virginia reactors, at Surry, have won several environmental awards, including the Conservation Service Award of the U.S. Fish and Wildlife Service; the Governor's Environmental Excellence Award for 2001; the Governor's Award for Outstanding Stewardship; and the Edison Electric Institute Land Management Award for 2000. The company was one of the first electric utilities in the country to establish a permanent environmental department in 1971. The company works to protect migratory birds and wildlife through agreements and licenses from the U.S. Fish and Wildlife Service.

The North Anna site was designed so that cooling water discharges into an innovative, 3,400-acre system of lagoons. By the time it passes through the lagoons, it returns to Lake Anna at normal temperature. The company focuses on protecting and enhancing fish populations on Lake Anna, one of the leading recreational facilities in the state. Special structures of brush and cinderblocks have been sunk in the lake to improve fish habitat.

Dominion biologists regularly monitor the health of fish populations in the lake. A two-year study recently confirmed that the lake supports a healthy, growing fish population. While cooling water is returned to the lake at normal temperatures, in winter it is warmer than the chilled lake

water. The warmer water has lengthened the growing season, and increased the size of game fish such as striped bass and walleye. Also, Lake Anna is the only body of water in Virginia in which the threadfin shad can remain alive during the winter.

Dominion has a history of partnering with state parks. In 2000, North Anna volunteers built a nature pavilion and assisted in creating a baseball field at the Bumpass-Beaverdam Park in Louisa County. In recent years, volunteers have built nature trails, fishing piers and a nature pavilion at North Anna State Park in Spotsylvania County.

Dominion has planted bald cypress trees around portions of Lake Anna to control soil erosion. The company also has a successful program to control hydrilla, a noxious aquatic weed that had become problematic for recreational users of the lake.

Surry 1 and 2—Surry, Va.
Surry is located near the James River, and it was designed so the cooling water discharges upstream of the river, to protect sensitive oyster beds downstream.

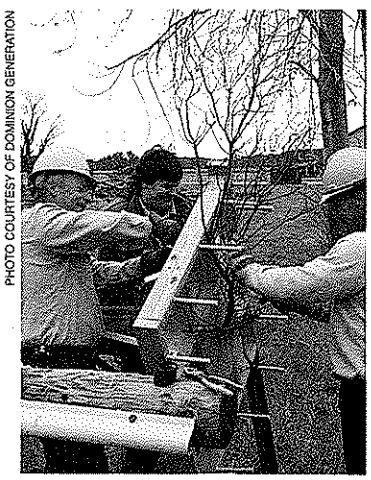


PHOTO COURTESY OF DOMINION GENERATION

▲ *Securing an osprey nest near Dominion's Surry Power Station.*

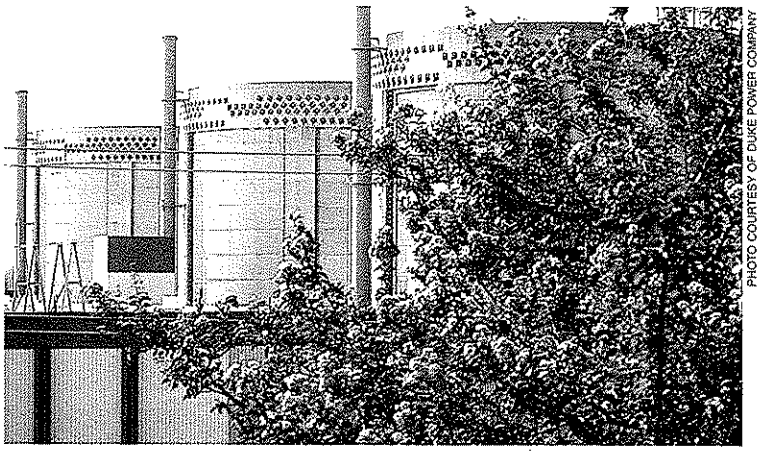


PHOTO COURTESY OF DUKE POWER COMPANY

▲ *A profusion of flowers near the Oconee plant in South Carolina.*

Dominion developed and patented an intake water traveling screen system at Surry that lifts fish away from the water intake canal and places them unharmed back into the James River. The system is now used worldwide. Dominion also excavated the containment domes at Surry deeper than they needed to be so that the structures would not visually interfere with tourist views of Colonial Williamsburg and historic Jamestown. Excavated materials from the site were used to build levees, dikes and roads to the adjacent state-owned Hog Island Wildlife Management Area. This has allowed the state to improve controlled flooding and waterfowl management at Hog Island.

Surry has the same system of policies, procedures and licenses from the U.S. Fish and Wildlife Service that guide environmental activities at North Anna. For years, bald eagles have had a nesting site on Surry property. Even in the 1970s, when the bald eagle population in Virginia was extremely low, this nesting site was one of the most successful in the state, often raising two to three birds each year.

Surry has a history of partnering with Chippokes Plantation State Park. Most recently, employees helped to spruce up the park by mounting interpretive signs and kiosks, planting seeds for birds and building a 600-foot fence.

Duke Power Company

Duke Power has had a corporate environmental program since the 1920s. All three of the company's nuclear stations are certified as Wildlife and Industry Together (WAIT) sites. The North Carolina Wildlife Federation has certified the McGuire site, and the South Carolina Wildlife Federation has certified the Catawba and Oconee sites. It is the only nuclear utility with multiple sites to have all of them WAIT certified. The state wildlife federations require demonstration of wildlife habitat stewardship and community involvement for certification. Duke Power has won several National Wildlife Federation awards, including the first corporate Conservation Achievement Award, and became the first utility to win the presti-

gious Land Stewardship Award from the National Wild Turkey Federation.

Oconee 1, 2 and 3—Seneca, S.C. The 300-acre site is a mix of hardwoods, pines, shrubs, wetlands and mowed grassy areas. It was divided into 16 sections so each department at the site would have its own habitat to manage. Under the wildlife workplace habitat plan, a large portion of the site's mowed areas on steep banks was left uncut, saving money and producing valuable wildlife habitat, conserving moisture and reducing erosion. Moist roadside strips were also left uncut, producing mini-wetlands areas. Many wildlife food plots were planted, and log and rock piles were established for habitat.

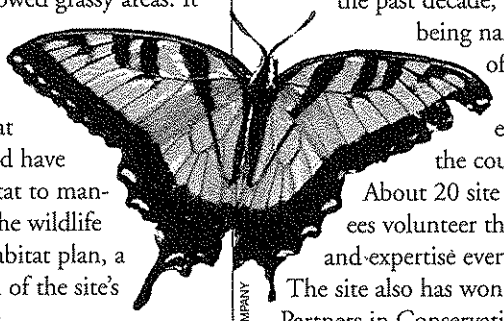


PHOTO COURTESY OF DUKE POWER COMPANY

▲ *The swallowtail butterfly is a frequent visitor at Duke Power's Oconee plant butterfly garden.*

A large area of previously cut grass was left natural and is burned every three years, producing lush and diverse vegetation to attract meadowlarks, bluebirds, hawks and small mammals. A songbird orchard, with more than 300 plants, was built in a large open area.

Employees have built and placed more than 200 bluebird boxes on site. Carolina wrens, bluebirds, tree swallows, tufted titmice and Carolina chickadees use the boxes. The plant also has worked with state and private wildlife agencies to restore peregrine falcons to the area. Employees also built an observation deck overlooking the plant's six-acre wetlands area. They also added rock piles, wildlife legume plantings and wood duck and owl nesting boxes.

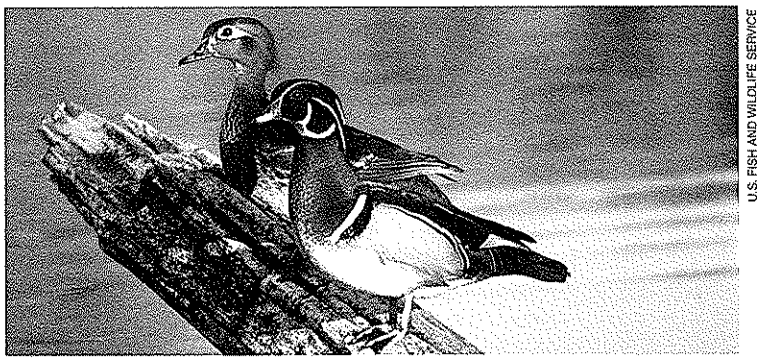
Oconee has hosted a National Wild Turkey Federation youth education program called JAKES (Juniors Acquiring Knowledge, Ethics and Sportsmanship), for the past decade, twice being named one of the top five events in the country. About 20 site employees volunteer their time and expertise every year. The site also has won a Partners in Conservation Award from an area chapter of Trout Unlimited. The plant also has a butterfly garden, maintained by the South Carolina Garden Club, at its visitors center and a quarter-mile nature trail. The site has hosted many environmental events, staffed by employee volunteers and attracting thousands of visitors.

Catawba 1 and 2—York, S.C. In addition to the WAIT certification, the plant has a partnership with the South Carolina Department of Natural Resources to encourage wildlife habitat in the York County area. Plant employees developed a grassroots program with the SCDNR and Quail Unlimited to enhance the local quail population. Volunteers planted food plots in unused fields around the plant for the birds. Catawba workers also built a nature trail around the energy information center that features bluebird nesting boxes.

Environmental program highlights at Catawba include a nesting pair of osprey, a butterfly garden and a nature trail. The plant also sponsored an environmental backpack program for every elementary and middle school in York County. The backpacks provide students with books on wildlife, environmental experiments and equipment.

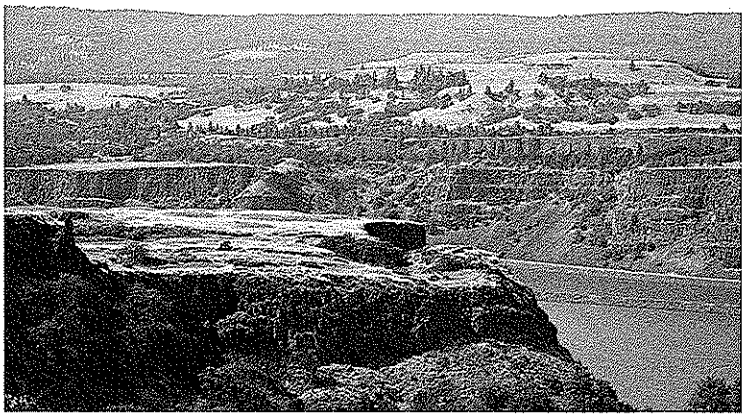
McGuire 1 and 2—Huntersville, N.C. Employees at the McGuire site have worked with the North Carolina Wildlife Resources Commission and conservation groups to enhance wildlife areas around the plant. They have planted several acres of food plots in power line rights of way to attract deer, songbirds, dove, quail and wild turkey. Salt blocks are placed near the food plots for deer. Brush piles on the edges of the rights of way provide cover and nesting areas.

The plant built platforms as nesting sites for osprey that were reintroduced to the Lake Norman area several years ago. In 1996, wild turkeys were reintro-



U.S. FISH AND WILDLIFE SERVICE

▲ *The McGuire plant increased habitat for wood ducks and other aquatic birds.*



▲ *The Columbia Generating Station is a vital part of the power system of the beautiful Columbia River, which flows through the Columbia River Gorge, shown above.*

duced to the area when 16 turkeys were released on the McGuire property. They are now a common sight. Employees built a "green tree reservoir" to increase habitat for wood ducks and other aquatic birds as well as amphibians and reptiles.

The McGuire site is part of an area that has been designated as the first "Important Bird Area" in North Carolina by the National Audubon Society. Bluebird boxes have been placed around the site, and local scouts and students count the bluebirds in the boxes.

The McGuire Visitors Center maintains an educational nature trail with exhibits, a demonstration wildlife food plot and a butterfly garden. Its North Carolina Certified Backyard Habitat Area was built by a local high school environmental science class. Last year, the site began working with the Mecklenburg County Parks and Recreation Commission, Davidson College and a local high school as part of the Central Carolina Amphibian and Reptile Initiative.

Projects include an ecology pond habitat. The site also maintains a fish-friendly pier for visitors who arrive by boat and supports a butterfly count conducted by the local Parks and Recreation Commission. Employees also are building a duck blind for viewing ducks on a site pond.

Energy Northwest

Columbia—Hanford, Wash. Columbia Generating Station is a vital part of the federal Columbia River Power System, meaning its output is critical in attempts to help the Pacific Northwest's hydro system enhance salmon survival at dams. The station is located just three miles from the Columbia River and is surrounded by near-natural shrub-steppe range—habitat for a wide variety of wildlife accustomed to what is a diminishing ecosystem in the West. In addition, Energy Northwest is in the process of purchasing about 3,000 additional acres to be used as a wildlife reserve managed by the state.

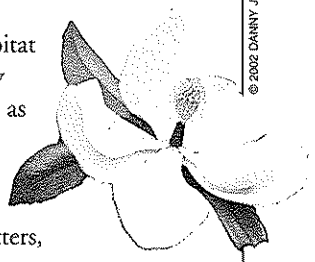
Entergy Operations Inc.

ENTERGY NUCLEAR SOUTH

All four of the company's sites have active recycling programs and each participates in Earth Day public education programs. Entergy administers an annual environmental grant program, designed to encourage non-profit organizations, nature centers and schools to make environmental investments in communities around each nuclear site. Entergy has committed $150,000 in grants for projects associated with environmental research, awareness, recycling, parks and nature areas, wildlife habitat and coastal/wetlands restoration.

Arkansas Nuclear One—Russellville, Ark. Plant personnel work with the Arkansas Game and Fish Commission to conduct select fish population studies in surrounding area streams and lakes. The plant also furnished materials for the department in establishing a boat ramp for public use. Forested areas are selectively managed and harvested to minimize environmental impact.

Grand Gulf—Port Gibson, Miss. About 2,000 acres at the Grand Gulf site are wetlands and upland hardwood forests. The wetlands are a seasonable floodplain along the Mississippi River that provide valuable habitat to migratory birds as well as resident populations of alligators, river otters, fish and other flora and fauna. At Grand Gulf's request, the U.S. Army Corps of Engineers identified the wetlands areas, and these are managed and protected as a valuable environmental resource.



▲ *Entergy's Grand Gulf plant abounds in magnolia.*

Forested areas are selectively